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ABSTRACT

A majority of seventy-three studies dealing with the effect of desegregation on black achievement conclude that desegregation has a beneficial effect on black achievement scores. These findings are in agreement with various national surveys that have found black achievement higher in predominantly white schools. However, a number of desegregation studies have not found higher black test scores after desegregation. This may be accounted for by the following: (1) weaker studies are less likely to find positive desegregation effects; and (2) certain kinds of desegregation plans are less likely to have positive effects than are others. A comparison of the 73 studies does lead to the important conclusion that desegregation is more likely to have a positive impact on black test scores if it begins in the earliest grades, and effects are especially likely to be positive for first graders. Another finding suggested by the studies reviewed is that voluntary desegregation plans are less likely to yield results than are mandatory plans. (Author/EB)

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WORKING PAPER

Desegregation and Black Achievement

by
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and
Rita E. Mahard

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Desegregation and Black Achievement

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presented to the National Review Panel on School Desegregation

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ABSTRACT

Seventy three studies of the effect of desegregation on black achievement are reviewed. A majority of these studies conclude that desegregation has a beneficial effect on black achievement test scores. This agrees with various national surveys that have found black achievement higher in predominantly white schools. However, a number of desegregation studies have not found higher black test scores after desegregation. Partly, this is due to methodology; the weaker studies are less likely to find positive desegregation effects. But it also seems that certain kinds of desegregation plans are less likely to have positive effects than are others. A comparison of the 73 studies leads to one important conclusion: that desegregation is noticeably more likely to have a positive impact on black test scores if it begins in the earliest grades, and effects are especially likely to be positive for first graders.

One other finding is suggested; among the studies reviewed, voluntary desegregation plans are less likely to yield positive results than are mandatory plans. Several hypotheses are suggested to explain this finding. The most significant is the "vulnerable age" hypothesis, which argues that students should not have their environment disrupted during elementary school years. Additional research is needed to test this and other hypotheses before any firm conclusions can be drawn.

DESEGREGATION AND BLACK ACHIEVEMENT: A REVIEW*

In the literature on desegregation, its effects upon black and white achievement test performance have received an undeserved emphasis. There are probably well over a hundred studies of achievement test performance after desegregation; when we contrast this with the number of studies that have been done on the other aspects of desegregation, the emphasis is embarrassing. It is even more embarrassing when we consider the justification for all this research. At least part of that justification lies in the belief that the major problem facing minorities and especially blacks in this society is their lack of cognitive ability. Christopher Jencks (1972) has virtually demolished this argument by pointing out how small a proportion of the black-white income difference can be statistically related to racial differences in cognitive performance. Nevertheless, the emphasis on "basic skills" remains. The achievement test performance of blacks is also of public interest because for 75 years the lower test performance of blacks has been used as an argument for their racial inferiority. We suspect that many black and white elites still subscribe to the theory that one can measure the economic productivity, and for that matter the moral worth, of human beings by finding out whether they can correctly state the Pythagorean Theorem, add two improper fractions, or select the answer on a multiple choice battery indicating that they have properly decoded a paragraph about the nesting habits of bluebirds.

Even if one assumes that achievement test performance is important, it is still questionable whether change in cognitive performance at a greater or lower rate between the ages of seven and nine, for example, will have any great bearing on a student's ability to perform cognitive tasks as an adult.

Although we think there is good reason not to overemphasize the importance of achievement test performance, it is still worthwhile to review this literature. All else equal, it is probably better to score high on a test than low; and the fact that students at a particular school do score well may indicate that the school has done a good job of making students want to learn and want to do well on tests, which in the long run may be as important as what they actually learn.

The literature on desegregation has been mainly concerned with determining whether desegregation is a beneficial policy or not. One clear answer has already appeared from this literature. Virtually every writer on the subject has agreed that white test performance is unaffected by desegregation. We think it is safe to assume that this issue is settled, at least until some dramatic new research is done, and we will ignore the topic of white achievement in this paper. There is much less agreement on black achievement, and writers have argued whether desegregation is a worthwhile policy on the basis of differing interpretations of that literature. While the future of desegregation will not and should not be determined by test scores, and while the supreme Court will not reverse the Brown decision simply because black test scores have not gone up as fast as we think they should, a clear reading of the achievement literature may have a marginal impact upon court decisions and even on legislation. More important, this literature can be analyzed to suggest optimal strategies for desegregation--which grade levels to desegregate, for example.

The Input-Output Literature

We have also chosen not to review the Coleman Report (1965) and the other major input-output analyses of achievement test performance. We have not done so for two reasons: first, a good review of this material is now being completed and there seems no reason to duplicate it. Secondly, the research issues are somewhat different and it is useful to keep the two types of studies separate in our minds. The input-output research uses school racial composition as the independent variable, rather than presence of a particular type of desegregation plan. Most of the racially mixed schools of the U.S. result from what is sometimes called natural desegregation: the assignment to neighborhood schools of students from mixed neighborhoods or from adjoining segregated neighborhoods. This means that the input-output studies are evaluating the effect of long-term desegregation, both for the students and the schools uneffected by public controversy or any impact of "busing". In contrast, the evaluations of desegregation have almost without exception been done during the first two years after the plan was implemented. It seems reasonable to think that intentional and natural desegregation are in the long-run indistinguishable, but the impact of the first two years of intentional desegregation may be different from long-term "natural" desegregation effects.

Bridge, Judd, and Moock (The Determinants of Educational Outcomes: The Effects of Families, Peers, Teachers, and Schools, forthcoming) have reviewed the input-output studies. They conclude that there is no relationship between white achievement and school racial composition and, with one exception, find black test performance to be higher in predominantly white schools. The one exception (Winkler, 1975), is interesting. Winkler finds, in one California district, a negative effect on students who come

from black elementary schools into predominantly white junior high schools, but he also finds a positive effect of attending white elementary schools. This suggests that desegregation delayed until sixth grade is dysfunctional. We will examine this issue in this review. An analysis of the National Longitudinal Study (NLS) of the 1972 high school senior class (Crain and Mahard, 1978) was not reviewed by Bridge et al. This study takes advantage of the very large NLS sample (23,000 students in 1,000 schools) to look at the North and South separately. A regression equation for the northern data shows a significant positive relationship between school percentage white and black achievement. The size of the regression coefficients suggests a difference between all-black and predominantly white schools of 3.7 standard score points, or slightly over one half of a black standard deviation (Table 1). However, black achievement is not higher in southern predominantly white schools. We will consider some interpretations of this anomaly later.

This study and those reviewed in Bridge et al. use a variety of methodologies. They include analysis of six data sets in addition to re-analysis of the Coleman data. Their consistency is important. There are still some unsettled methodological issues. In any analysis the problem of how to control on background factors is important. In most of these studies the blacks in predominantly white schools are of higher social status than those in segregated schools. When this is the case, a control using an imperfectly measured variable, such as a pretest score or a measure of socioeconomic status, will be inadequate to remove all of the background-related differences in achievement between these two groups. There are various statistical techniques but ultimately the only answer is perfect measurement of all spurious variables which is, of course, impossible. A second problem is a self-selection bias. If parents who

move into integrated neighborhoods are more motivated to help their children then a bias is introduced that cannot be easily removed. In our analysis of the National Longitudinal Study, we attempted to test for a self-selection bias and found no evidence that the higher achievement of blacks in northern predominantly white schools was a result of self-selection. But this is only one analysis and the problem requires more work.

Despite these reservations, the consistent finding of the studies that black achievement is higher in predominantly white schools is an important contribution to the desegregation literature. These analyses of so-called "natural desegregation" play a role that no evaluation of a particular desegregation plan can duplicate. Even the most carefully designed evaluation tells us about only one school system and only about the effects of the first one or two years of desegregation. Input-output studies can measure the long-term effects of desegregation, and in the case of the Coleman and NLS studies, can strike an average across a large number of districts.

We do not expect publication of the Bridge et al. analysis to settle more than a small portion of the conflict over the effects of desegregation -- partly because of the methodological issues mentioned above, but mainly because of the arguments over how large an effect should be before it can be considered "positive." Scholars who have stressed closing the black-white achievement "gap" have concluded that desegregation is of little importance. For example, Cohen (1972, p. 358) argued that the Coleman Report indicated that "only" one-fifth of the black-white gap can be removed by desegregation. If "closing the gap" is the goal of desegregation, it has failed. But we think this is an unreasonable standard. We have learned in the last decade of research that there is no miracle drug that can make the black-white gap disappear overnight. Assuming that the racial composition effects in

these input-output studies are not due to methodological error, then dismissing desegregation on the evidence that it will raise black achievement "only" one grade level (which makes it the most effective tool for raising black achievement located by researchers) seems absurd.

It is worthwhile to complement the Bridge et al. review of the input-output studies with a review of studies of particular desegregation plans. Studies of desegregation plans can sometimes control for SES differences and for self-selection more carefully than the input-output studies. Second, if the input-output studies are correct in indicating a long-term positive affect of desegregation on black achievement, it is worthwhile to analyze the process by which that long-term effect is reached. Finally, a comparison of different desegregation plans can help us understand which strategies are most effective. The short-term desegregation evaluations do not show results as consistently positive as those found in the long-term studies. Partly this is because they are not as well done. But we also suspect that under certain conditions the short run effects of desegregation are not positive. The difference between the short run and the long run has to do with more than duration of desegregation. Student performance can also be affected by community conflict, by part-time desegregation which is not reinforced by neighborhood integration and by the racial attitudes of black and white students and staff. Desegregation may have a short-term negative effect if teachers do not adapt their teaching methods or if black students do not make the transition to a white school easily and are upset by racial issues or simply by the change in schools. The main aim of this paper, then, is to determine what characteristics of desegregation plans are most likely to result in immediate positive achievement effects.

The Sample of Studies

Supplementing the previous reviews of the literature by St. John (1975) and Weinberg (1977) with some additional library searching, we have identified approximately 100 studies of desegregation and black achievement. Of these 100, 41 research reports have been obtained and reviewed[3] and an additional 32 studies have been reviewed by either St. John or Weinberg. These 73 studies make up the sample for this paper. This sample is limited only to studies of a definite desegregation plan. Studies of neighborhood integration are ignored on the assumption that they can tell us little that the generally better quality input-output studies cannot.

We should also note that in our review of the literature, we located one evaluation of the effect of riding a school bus as opposed to walking to school in a rural school district (Davies, 1969). After careful thought, we concluded that an evaluation of the effects of riding a bus has nothing to do with the evaluation of busing and discarded the study. Other studies will be added to future versions of this paper as they are identified. This review owes a great debt to the extensive bibliography prepared by Meyer Weinberg. However, even this bibliography is not complete. There is surprisingly little overlap between the St. John and Weinberg bibliographies, suggesting that the 87 citations that we have taken from Weinberg may be as little as one-half of the available literature. Even after inadequate studies and those which duplicate other reports are eliminated, there may well be as many as 200 studies in the United States. This is a fugitive literature. Of the 41 studies we have received to date, only 16 are published in scholarly journals and books. The remainder are unpublished reports and dissertations, and many are not available in the ERIC library. Each study is coded on:

- The demographic characteristics of the community
- The type of desegregation plan
- The methodology used in the research
- The racial composition of schools before and after desegregation
- The grade levels of desegregated students
- The direction of the achievement effect, and its magnitude expressed as change in either grade equivalents or standard scores, and reports of any interaction effects in the data (e.g. a finding that desegregation effects are stronger at one grade than another)
- The presence of special programs to improve the quality of education, or to prepare students or staff for desegregation
- The source of research funding, the position held by the researchers, and the form of publication

This is an interim report. When all the studies have been obtained, the analysis will look at the relationship of achievement to the type of plan, degree of school or staff preparation, and student characteristics. We will use data on the research itself to test hypotheses about bias (e.g., do academic researchers fail to publish negative findings?). In the present paper, we will address only two questions:

What is the average effect of desegregation on black achievement?

What are the effects of age of student, region or the country, and voluntary vs. mandatory assignment on black achievement?

Of the 73 studies, 40 find a positive effect of desegregation on black achievement, and only 12 show a negative result--positive findings outnumber negative findings by a ratio of three to one. The agreement between these studies and the input-output research is encouraging, although we should again point out that some writers will argue that the gains are usually small compared to the overall white-black achievement gap. We cannot make a comprehensive statement about the magnitude of these effects,

since many studies do not provide enough information to permit us to convert effects into either standard score differences or grade equivalents.

The 41 studies which we have received and reviewed are a biased sample of the 73, including somewhat fewer studies with positive findings and more studies with negative results. Part of this is because we have chosen to interpret some small differences as negative rather than as zero. The comparison of the results of studies reviewed by us to those reviewed by Weinberg and St. John is shown in Table 2. Our tabulations may also differ from theirs in that we have discarded studies which evaluated natural desegregation, or which duplicated another, better study of the same plan. The list of studies reviewed by Weinberg, St. John and us is given in the appendix.

Methodological Issues

The paradigm for evaluation research is the experimental model. The experiment is as simple as it is effective, consisting of only three basic steps. First, the population is randomly divided into two groups. Second, a treatment is administered to one of the two groups and not the other, and third, a measurement is made. If there is a difference between the two groups at the end of the experiment, the difference can almost always be assumed to have been caused by the treatment. One serious problem with applying the experimental method to desegregation is that the treatment in this case is of thirteen years duration and no one thus far has been willing to wait that long to publish their results. There are also serious questions about whether the standard achievement test is the correct measure of cognitive outcomes, but we will ignore that issue here.

Experimental research can be hard to pull off, and in some cases it is impossible. A mandatory desegregation plan which reassigned every

student could not normally be altered to randomly exclude some students. But there are many cases when experimental design is possible, and at least two studies have used one. The two designs differed only slightly. In both cases, black students in an inner-city school system volunteered to attend predominantly white schools in the suburbs. In the study by Mahan a group of inner-city classrooms were identified and twelve classrooms selected by a table of random numbers.* A subsample of the unselected classrooms was used as the control group. Parents of the treatment group were notified and their cooperation requested. Ninety-six percent of the parents agreed to permit their child to attend suburban schools. Thus, although this is a voluntary project, for research purposes it is the same as a mandatory re-assignment except for the 4 percent who refused. The second study by Zdep is more conventional: parents were asked if they wanted to voluntarily send their children to suburban schools, and a random sample of treatment and control students were selected from among the volunteers. Refusing some volunteers was possible in this case because the suburban schools were only willing to accept a limited number of students. Both studies used pre-test achievement test scores gathered before desegregation. A control on previous achievement eliminates a good deal of variance in the dependent variable, meaning that effects are more likely to be significant with a small sample size. However, as Campbell and Stanley (1966) have pointed out, a pre-test is not necessary; a cross-sectional analysis is sufficient when students are randomly selected.

The next best alternative to randomization is a study in which a convincing argument can be made that something akin to a random process has taken place.

* To help the study's legitimacy, the lottery was conducted by minority leaders.

The best example of this is the research of Schellenberg and Halteman in Grand Rapids, Michigan. In this case, students were reassigned from inner-city schools to white schools to relieve overcrowding and the areas designated for reassignment were those areas which were farthest from neighborhood schools. Schellenberg and Halteman argue that there was no reason to assume that students who lived in a particular block were in any way different from students who lived a block nearer to the school. A similar argument can be made with Evans' report of desegregation in Fort Worth. He presents a map of a desegregation plan showing that the areas included in the plan are widely scattered throughout the city and seemed to be chosen mainly for geographical reasons rather than because of any student characteristics.

A considerably weaker design is the conventional longitudinal design with students matched on pre-test scores or on SES. One problem is that in a voluntary plan there is a serious possibility of self-selection bias. This is especially true if the volunteers represent only a small fraction of the total student population available. Students attending desegregated schools are more likely to have parents who are interested in desegregation, or interested in their child's school performance, or simply more likely to have heard about the plan. Various tricks have been used to match students to an artificial control group under these circumstances but none of the techniques are infallible. Walberg and Armor each evaluated the Boston METCO Plan using siblings of transferred students as the control group. The argument for sibling matching is that it controls well on home environment factors and on the gene pool. But this may not be a good solution, since sibling controls virtually maximized the possibility of self-selection bias. Parents chose to bus one of the children but not another. Presumably they did so because of feelings about the differences between their children. We do not know whether the child

most likely to succeed in school or the child having the most difficulty in school was usually selected. But whichever the case, a bias has been introduced. A second problem is the one alluded to in our discussion of input-output studies: if the two groups are not identical in social class or ability, controls will not eliminate this difference entirely. A final problem with all studies using control groups is that a control group may not exist. Again, one can take desperate measures but this may not help. For example, Carrigan, in her study of Ann Arbor, used as her control group black students who were not reassigned for desegregation purposes. Unfortunately for the research, the reason they were not reassigned is that they were already in a school that was 50 percent white.

Cross-sectional studies without pre-tests, but using a group of blacks in a segregated school as a control, are also possible. They have the disadvantage compared to longitudinal studies in that measures of SES are not as good predictors of achievement as are pre-test achievement scores. Consequently, the cross-sectional studies have a weaker control variable. They do have the definite advantage that they are lower in cost, lend themselves to studies across a number of school districts simultaneously and permit the researcher to administer the achievement test, thereby controlling the testing situation.

While it is possible to study desegregation without a segregated black control group, the problems are much more serious. Unfortunately, districts where every student is desegregated must be analyzed using cohort comparisons or comparisons to white students or national norms. A cohort study asks whether the black students in a particular grade after desegregation are performing better or worse than black students who were in the same grade before desegregation, i.e., in an earlier cohort. This requires that we assume that

the students in the two cohorts are similar--that there has been no secular trend in the student population over time. Perhaps even more important, the design requires that we assume that there is no difference between the two years in the testing conditions. In at least some studies these conditions are obviously not met. Aberdeen's study of Ann Arbor found a decline in achievement test scores over time. However, Carrigan's analysis of the same data shows that in one year, IQ scores of black students in the district jumped nearly five points. It is doubtful whether either the IQ jump or the achievement test score decline should be trusted. Kurtz, the Research Director of the Pasadena School System, reanalyzed the Evanston data. He reported that black scores declined steadily after desegregation. However, he found a similar decline for white students which suggests that something other than desegregation was involved.

The weakest possible design is to compare the post-desegregation performance of black students either to white students in the same district or to national norms, which usually means a comparison to a virtually unknown and non-random sample used by the test manufacturer. Even under the most careful statistical controls, it is difficult to interpret these results. For example, Perry's study of the talented black students who received scholarships in elite private schools in the ABC Program found that black achievement did not go up. In order to do this analysis he equated black ninth grade test scores to the test scores of whites in these private schools and found that compared to their white classmates of equal ninth grade performance black students did less well on their twelfth grade tests. He was, of course, well aware that this is inadequate evidence, given that the black-white achievement gap increases with age under normal conditions. He did attempt to construct a control group of black

applicants who were not admitted to the program because of limited space, but was unable to obtain a sufficient number of those students.

It is often assumed that methodological weakness in a study tends to produce false positive results. This is an unwarranted assumption. If the methodological weakness is the inability to adequately control for sharply differing pre-test conditions between the treatment and the control group, then these pre-test differences are likely to persist, producing a false positive or negative result. But these are not the only sources of error. If the error is simply noise, it is likely to produce gibberish and a nonsignificant difference between the two groups. If the error is inadequate control for either the known secular decline in achievement occurring in the past few years in the nation, or the known increasing achievement gap between blacks and whites with age, then a false negative is more likely. Our data seem to bear this out. Of the three studies which compare black to white achievement, only one produces a positive result. Of five studies which compare black performance after desegregation to national norms, three find negative results. The same pattern occurs with the cohort studies. Of eight cohort studies which compare black performance after desegregation to the performance of students in the same grade before desegregation, only three find a positive outcome. To put it another way, the studies using white comparisons, national norm comparisons, and cohort comparisons produce half of the negative findings in the 41 studies we have reviewed but only one-third of the positive findings.

In reviewing the 41 studies, we attempted to construct the strongest methodological test from each study. Frequently, several different tests of the achievement effect are done; we reported the one we judged to be the strongest design. For example, if the study reported both a comparison of the

achievement of desegregated black students to national norms and a comparison to a previous cohort, we used the latter design. In some cases the stronger design is flawed, and a theoretically weaker design was judged better. For example, we discarded Carrigan's control group because they were in a bi-racial school, and used her cohort comparisor instead.

The Effect of Region

The 41 studies we have reviewed show a clear regional pattern (Table 3). Two-thirds of the sourthern studies show positive outcomes, compared to only 35 percent of the northern studies. This result must be taken as tentative at best, since it is not supported by the data from the 32 other studies which St. John and Weinberg have reviewed but which we have not yet received. Those studies also find a very high positive outcome pattern in the South, but differ from the 41 studies we have received in that they also find a generally positive outcome in the North as well. Probably when these other studies are included the North-South difference in our analysis will be greatly reduced. Nevertheless, it does seem safe to conclude at this point that if there are problems with the short-term impact of desegregation, they are not occurring in the South. Ten of the 15 Southern studies we have reviewed find positive results. We hypothesize that Southern desegregation produces short-run positive gains in nearly all cases, and as a corollary of this, that there will be more methodological weaknesses in the five deviant studies than in the ten studies showing positive results. Their corollary seems to be true; there are factors which make us hesitate to take the five non-positive findings as seriously as the ten positive findings.

The five include Stalling's 1955 study of Louisville done after the first year of desegregation, which found that black students in segregated schools gained over the preceding year more than the blacks who transferred to the integrated schools did. But scores of both groups went up compared to the preceding year (as did white student scores) and it is hard to argue that desegregation had a negative effect when scores go up, and many writers have cited Stallings as evidence of a positive result of desegregation. Justin and Thabit found a decline in black test scores after desegregation in Florida, but this is a cohort comparison and was accompanied by a white decline as well--exactly the opposite of the Stallings results. This suggests that the test situation may have changed or a secular decline in performance may have been going on. Felice's study of Waco, Texas, finds a negative result, but his sample is small (only 55 students in the control group) and while the control group is matched to the treatment group on previous achievement they are mismatched on age, grade and sex, which may have influenced the results. Fortenberry's study of desegregation in Oklahoma is limited to the eighth and ninth grades and was apparently ambushed by unusual differences in curriculum in the black and white schools (see below). Of the five studies, only a study of Dade County desegregation which found a decline in black students who were reassigned to white schools seems methodologically sound and here again the data are complicated by secular trends in the performance of blacks in segregated schools. Much of the apparent loss due to desegregation can be attributed to a gain over time among black students in segregated schools.

The ten Southern studies which find positive results seem somewhat stronger methodologically. They include the two seemingly well-done Fort Worth studies by Evans, and the technically careful Mayer et al. study.

We can formally test the proposition that methodological differences account for some of the negative results in the Southern studies. We know that cross-sectional studies are weaker than longitudinal studies and of the four negative studies here, two are cross-sectional while only two of the ten positive studies are cross-sectional. We also have reason to suspect that evaluations done at the end of one year of desegregation are less likely to be favorable than those that wait two years. Of the six evaluations done after one year of desegregation only three obtained positive results, whereas of the six done at the end of the second year or later, five are positive (the remaining three cannot be dated.) If we cross tabulate methodological factors against outcome, we find that the association between desegregation outcomes and the use of the cross-sectional design is a gamma[4] of -.5 and the gamma between years of desegregation at post test and outcome is +.55.

These data seem to indicate that desegregation in the South has resulted in consistently positive outcomes. This is similar to the northern input-output studies of school racial composition, but the only southern input-output analysis is that done with the NLS, which does not show a positive effect of school percentage white. There is a reasonable explanation for this. The NLS data are for 12th graders only. These students had experienced only two or three years of desegregation in 1972. But it is widely believed that desegregation may take longer than two years to show positive effects. It is also frequently argued that successful desegregation should occur in early elementary school, and almost no black senior in 1972 was desegregated that early. (Our own analysis, below, strongly supports this position). The Winkler study goes a step further and suggests that desegregation occurring after grade 6 is detrimental. All this suggests that positive effects have not had time to appear in the

1972 survey. This is supported by the findings of the National Assessment of Educational Progress (1976) which found that between 1969 and 1973, the achievement of southern black 9 year olds went up, while the nation's as a whole declined; the southern white-black achievement gap declined for this age group but not for 13 or 17 year olds. The gap increased for northern 9 year olds, and southern whites did not gain on northern whites. We do not know if the increase in black 9 year old achievement is due to desegregation, although a great deal of desegregation occurred in that time. There was also some definite improvement in the quality of schooling for blacks generally in the South. But if this gain is attributable to desegregation, the fact that it occurred for young students but not older ones reconciles the positive findings of the southern desegregation evaluations with the NLS results.

There seems to us to be a moderate amount of evidence here that desegregation increases black achievement in the long run and in the short run as well, at least in the South and in early grades. Whether the evidence is considered weak or compelling is no doubt a matter of taste. We would like to know how desegregation raises achievement, to the extent that it does, and what kinds of desegregation plans are most effective. These two questions can best be considered together, since knowing that a certain type of plan is effective can give us clues as to why desegregation works at all. Let us begin this part of the analysis by examining the finding already mentioned--that desegregation works best in the early grades.

Age at First Desegregation

The review of these studies is inconclusive or debatable on nearly every point except that desegregation in the early grades is superior to desegregation in the later grades. Of the studies we have reviewed, 13 found a more positive impact for those students desegregated in earlier grades. Only 3 have found the opposite and these 3 seem to be explainable. Beker's study in Syracuse was a tiny sample--his control group contained only 23 students, which can hardly be sorted by grade to get meaningful results. A second case where a positive finding was found for a higher rather than a lower grade was in Evans' study of the first year of desegregation in Fort Worth, but his own follow-up a year later reversed this conclusion. The third case of a more positive finding in the upper grade is in the Dade County study referred to earlier, but this seems to be explained not by the high performance of upper-grade students in white schools, but by a rather dramatic drop in the performance of the upper-grade students in segregated schools, whose achievement went down about a third of a year over the preceding year's class even though black achievement in other grades went up. The 13 positive findings are methodologically stronger. Included are the two northern experimental designs by Mahan and Zdep as well as the seemingly well done study by Schellenberg Even some studies whose overall effects are zero show positive results in early grades. St. John and Weinberg report three other studies in which stronger results occurred in the lower grades and both reviewers conclude that desegregation in early grades is preferable.

In a final test of the hypothesis we compared the outcome of desegregation reported in the different studies depending on which grades were tested. These results also indicate that early-grade desegregation is more successful. Of twelve studies of desegregation at the junior high school and high school level five show negative effects, while none of ten studies done in the first and second grade show negative results. Table 4 presents the data for the southern and northern halves of the sample we have reviewed, and as well as the data for 21 studies reviewed by Weinberg and St. John but not by us. All three samples support the hypothesis.

The table suggests that the critical point is around the 2nd to 3rd grade, since only 9 of the 21 cases of desegregation in grades 3 or 4 showed positive results. The poor outcomes of desegregation for third and fourth graders is suggestive, since these grades are in the center of an age range which Michael Inbar has called "vulnerable age." Inbar (1976) found that persons migrating to Isreal between the ages of 6 and 11 were less likely to later attend college than those who came at either younger or older ages. He has replicated this result using migration to Canada and regional migration within the United States. Crain and Weisman (1972) found a similar pattern for blacks who migrated from the south to the north at this age. Inbar quotes Harry Sullivan (1953) as theorizing that the elementary school years are an important period of establishing social relationships and recommending that social relationships not be disrupted in this time. If this theory is correct, the kind of social migration which occurs as a result of desegregation may have effects analogous to geographic migration.

It has been widely argued that desegregation should begin in the early grades. It is gratifying to see the data support our conventional

wisdom so clearly, although if the Inbar finding is relevant, even third grade may not be early enough.

Curriculum Factors

St. John argues that achievement gains are more likely to occur in mathematics than in reading. Of our 41 studies, 10 show this to be the case and only 3 studies find stronger effects in reading than in mathematics. However, we cannot dismiss these three studies so easily, since they represent two of the best desegregation studies done and the study done by the most prominent researcher in our sample--the studies of Goldsboro, North Carolina by Mayer et al., the Hartford experiment by Mahan, and the evaluation of METCO done by Herbert Walberg. All three show stronger gains in reading. The general rule seems to be that achievement gains are specific to curriculum, and where there is a marked difference in part of the curriculum of the sending and receiving schools, we can expect achievement changes in that subject which are sometimes dramatic. It may be true that mathematics is usually easier to learn in most desegregated schools, but this may be because of curriculum differences and not a necessary consequence of racial interaction. One of the best examples of this is the Zdep experiment. The first grade students randomly assigned to suburban schools gained over a full standard deviation in mathematics compared to their segregated counterparts. At the same time the second graders in the desegregation experiment lost .15 standard deviations compared to their segregated counterparts. Fortunately Zdep paid attention to the curriculum and he noted that the suburban schools used a modern math curriculum which was of high quality, but which the transferring second graders did not have the background for. The most dramatic example of what is probably a curriculum effect appears in Williams' evaluation of a desegregation program in a Florida county. The segregated secondary school

was a six year consolidated school with only 100 students per grade and only 30 teachers in the school. Williams notes that it was a modern building but the curriculum was "not comprehensive." Half of the black students transferred at the end of the ninth grade to the white high school which was much larger and had what Williams called a "fully comprehensive" high school program. At the pre-test in the ninth grade the transferring and control students tested the same in both verbal and quantitative IQ and in achievement. At the post test in the twelfth grade, the two groups tested the same in verbal IQ, but the quantitative IQ score of the desegregated group had gone up .6 standard deviations. In achievement, their English performance had increased .9 standard deviations and their performance in social studies, math, and science had all gone up .4 standard deviations or more. They had all gained an average of two to three additional grades in achievement in three years. Putting it another way, their rate of growth was more than double that of the segregated students, with no change in verbal IQ. The only plausible explanation for such extreme gains is that the white "comprehensive" high school had a markedly better curriculum.

Another study showing rather dramatic results which seem to be unexplainable except as a curricula effect is Fortenberry's study of Oklahoma City. Fortenberry is one of the southern studies which shows no positive effect of desegregation overall. It does, however, show marked differences in different subject matter areas. His control and treatment groups were matched on the basis of a sixth grade achievement test. By the ninth grade, the desegregated students had declined .7 of a grade in reading ability compared to the students in the control school. This is a disturbing result, but becomes especially intriguing when we find that these same desegregated students went up 1.2 grade levels in language arts. Obviously, these tests are not measuring a single verbal skill. We can only conclude that the black

school was doing a better job of teaching reading, but was not teaching ther mechanics of writing.

In general, our conclusion must be that where there are radically different curricula, desegregation can have sharply different effects in specific subject matter areas. In most elementary school studies this will generally appear as higher mathematics gains for desegregated students. In high school, it may appear in any of a variety of subject matter areas.

If other studies like Williams are found, we may have to reconsider our conclusion that large achievement gains do not usually occur quickly in secondary school desegregation in the South. For now, we can only reconcile William's remarkable results with the absence of a desegregation effect on the Southern NLS analysis by arguing that most of the woefully inadequate small segregated high schools of the South had been closed by 1972. The southern black students in segregated schools surveyed by the NLS cannot have been attending schools like the one Williams studied. These small schools were located mostly in rural areas, and there were very few segregated high schools in the rural South in 1972.

Voluntary and Mandatory Plans in the North

We now arrive at the most complex and difficult finding in our study. We analyzed plans according to whether the black students were mandatorily reassigned for desegregation or were volunteers. Our conclusions are shown in Table 5. The 26 northern studies that we have reviewed show a definite pattern--achievement gains are more likely to occur when reassignment is mandatory. For northern voluntary plans we have only two positive results in eleven studies, while northern mandatory plans show seven positive results in fifteen studies. The gamma is an impressive .54. (Disturbed by this unexpected finding, we returned to the St. John and Weinberg studies which

we have not yet reviewed. We found 20 studies and a similar pattern: voluntary plans are evaluated positively in 6 of 11 studies; but mandatory plans show positive results 7 times out of 9.)

Our next step was a methodological analysis of the exceptions. Looking first at the 11 voluntary plans, we find that the two voluntary plans which produced positive results are those analyzed by Zdep and Teele. There are peculiar aspects of each study which might explain the aberrant results, although the pecularities are not methodological. Both are good studies--Zdep uses random assignment, and the Teele study is methodogically weak but Teele did a brilliant job of, to use his phrase, "patching up" the study, after the Boston School Committee refused to allow him access to a control group.[5] Both studies have some unusual aspects, however. Zdep's case involves a very strong quality of schooling effect, since the black students who remained in segregated schools were on half-day sessions due to overcrowding. This might explain a portion of the very large achievement result which he finds--the desegregated students gained .9 of a standard deviation in the first and second grade overall, despite the loss for the second grade mathematics scores referred to earlier.

In addition, both studies have a somewhat unusual method for recruiting volunteers. The voluntary-mandatory distinction is a continuum rather than a dichotomy; programs vary from highly voluntary, where only a small number of students select the plan, such as in the ABC Program of sending black students to prep school, all the way to a virtually mandatory plan such as that analyzed by Mahan, in which 96% of the parents agreed to "volunteer." Zdep's design is almost identical to Mahan's except that permission slips were requested before reassignment rather than after. At least 50% of the parents agreed to reassignment, but he does not give the exact number. If a very large number of parents agreed to reassignment, then for all practical

purposes the plan is identical to a mandatory plan. The Teele study is also different from most voluntary plans in that the volunteers were recruited not by the school district but by a private black parents organization, Operation Exodus. A school-run open enrollment plan in the North appeals to a certain type of parent. Operation Exodus, which had a strong ideological community organization behind it, may have reached a very different set of parents.

Turning to the nine voluntary studies which did not find positive effects, we find several studies of good quality. The best is the Fox study of open enrollment in New York City which has a large sample size and seems to show conclusively that the students who volunteered for reassignment did not do as well as those who stayed behind. In addition, two voluntary programs in Syracuse produced no positive results, the two evaluations of METCO are unfavorable, and Wolman's evaluation in New Rochelle and Thompson and Dyke's evaluation in Rochester also showed no gains. Two other studies are less valuable since they deal with private school populations: Perry's study of ABC, which is clearly not comparable to any public school program, and Gardner's analysis of open enrollment in the Chicago Catholic School System. On balance, the best we can say here is that there seem to be some conditions under which voluntary programs are not successful.

A methodological analysis of the northern mandatory studies seems to suggest that the studies which obtained positive results are methodologically superior to those which did not. Of the 15 Northern mandatory studies, eight show non-positive results, but seven of the eight have characteristics which weaken their conclusions. Two of the non-positive results are from Ann Arbor, where Aberdeen and Carrigan found negative and zero results, respectively. Both studies have weaknesses. Aberdeen uses national norms and the school district changed the test being used in the middle of the evaluation.

Carrigan uses an integrated school for her control group. In reviewing her study, we have ignored this and instead used a cohort analysis which in this case seems more sensible. However, we have noted earlier the weakness of cohort results.

The problems of cohort analysis also plague the evaluations of Riverside by Singer and by Gerard and Miller, which are counted as two separate studies here. Gerard and Miller attempt to use a segregated control group, since one of the elementary schools in the district was desegregated in two stages with half the students remaining behind for the first year. Thus, a comparison of the two halves of the school enables us to see the impact of an additional year of desegregation on one group but not the other. They point out there is no reason to believe that the two halves of the student body differ. All this is well and good, except that the elementary school is entirely Mexican-American and consequently this result is not comparable to our 39 other studies of black-white desegregation. Fortunately, they tabulate the data for blacks and Mexican-Americans separately, which makes it possible for us to construct a cohort evaluation for blacks. The cohort evaluation seems to indicate no gain in achievement, but we do not know what sort of secular trends in achievement test administration occurred, what secular trends occurred in the composition of the district or whether the various tests used at various times are exactly comparable. The fifth study with non-positive results is the Kurtz reanalysis of Evanston data using a cohort design; but as we pointed out earlier he found that white scores were declining as well as black which makes this result suspect. We have reviewed a cohort evaluation in Berkeley which found an overall zero result. In the lower grades, however, the effects were positive. Thus the finding that desegregation failed to produce a positive effect in Berkeley is ambiguous. Both St. John and Weinberg show positive outcomes for Berkeley,

but they refer to studies we have not yet received. Bondarin analyzes the data from White Plains and judges no positive effect of desegregation, but this disagrees with other evaluations of White Plains. It seems reasonable to discount heavily these six studies of the four cities. Of the eight studies which show non-positive results for Northern mandatory plans, only the one by Schellenberg and Halteman seems to be of good quality. This is a carefully designed study which analyzes the effects of reassignment in the early grades after two years, with good reason to believe that the control sample was adequate. But with this one exception, the data on negative results in northern mandatory studies seem generally weak.

The seven studies which found positive results in northern mandatory studies seem much stronger. Four use adequate control groups. The Syracuse study is based on a single school, but Dressler, in Buffalo, and a study by the Sacramento School System both use students from several schools and get clearly positive results. The fourth study is Mahan's Hartford Experiment. All in all, it appears that the studies with positive findings are stronger than those with negative findings. We also tested this more systematically. We removed from both voluntary and mandatory northern studies all studies which were not longitudinal designs using a black control group. When we do this we have the 12 studies shown in the bottom panel of Table 5, and the correlation has become larger. Four of the six mandatory studies show positive results while only one of the six voluntary studies does.

On balance, we seem to have evidence which is internally consistent and statistically significant at the .10 level (when both the 26 studies reviewed by us and the additional St. John and Weinberg cases are combined, the correlation between mandatory assignment and positive outcome is .25). We are reluctant to recommend policy based on a finding so clearly counter-intuitive, except perhaps to say that we should be more cautious in

recommending voluntary desegregation plans for blacks as preferable to mandatory plans, and certainly should think twice before denouncing mandatory busing as an especially evil form of desegregation.

In thinking about the results, we see several possible explanations. The obvious explanation is that the volunteering blacks are more talented, and they do not improve because they were doing so well before desegregation. But this doesn't fit the data; we do not find that volunteers generally have higher pre-test scores. An opposite type of explanation seems more promising. We hypothesize that elementary school students are volunteered for desegregation by their parents, not because they are doing well, but because they are doing poorly. After all, why reassign a student who is happy in school? Isn't it more likely that in a program like METCO, parents will select the child doing badly in school, not the brother or sister who is doing well? But doing well in school is partly, or perhaps largely, a matter of adaption to bureacratic structure and to authority. Transferring to a white school requires even more adaptation, and it may be that the least adaptive students may be volunteering to make this transition. This hypothesis probably does not make sense for secondary school students, but none of these studies are of secondary school students except the study of the prep school ABC Program. Presumably secondary student volunteers would not be motivated to change schools mainly because they were doing badly where they were. We suspect they are more likely to transfer to enhance their chances of going to college; this suggests the possibility of a positive self-selection bias in secondary school, but not elementary school. If this hypothesis is correct, then positive effects should occur for students transferring in secondary school, or kindergarten and first or second grade (before the average child has established an academic record a parent could base a decision on). This receives some support from the

data, since the only studies of voluntary desegregation at grades K or 1 are Zdep's, which found positive effects, and Wolman's, which found the strongest effects at kindergarten, although the upper grades showed non-significant differences. St. John reports on two other studies of voluntary desegregation, one for grades K-2 and one for grade 2 only, which both show positive effects. Clearly more data are needed.

The hypothesis that the least adaptive elementary school students will be volunteered does not seem plausible in the South, however. One would hardly expect a southern black parent whose child was doing poorly in school to believe that he would be happier in a white school. It seems reasonable to argue that southern "pioneering" parents were motivated mainly by ideological or altruistic needs. If this is the case, then we cannot tell from these studies what the non-positive results from these studies of voluntary desegregation mean; these students are not doing as well as others who refused the opportunity to transfer, but they might have done worse than the non-volunteers if they had remained in the segregated school. If so, we have a methodological error in the design, since the control group does not match the treatment group. The second possibility is that the students who refused the transfer would have benefited from desegregation while those who volunteered did not; this is an Aptitude-Treatment interaction effect.

The third possibility is that no one would have benefited from desegregation in these cases. We suspect that when the plan is voluntary, there is very little pressure on the receiving schools to adapt to the incoming students. The principal, teachers and central administration may well feel that if students are volunteering to come to their school it must be a good school with no reason to change. In contrast, a mandatory plan often involves staff desegregation, in-service training and curriculum change. The new black teachers in the school may become spokesmen for the black students, and the community attention on the schools may make teachers feel that their

student body has changed in some important ways, and that the school must accomodate itself to this change. All of this activity may make mandatory desegregation work better than voluntary desegregation.

Our final hypothesis is the Inbar argument mentioned earlier. If migration has unfortunate effects because it disrupts the newly forming social bonds of the elementary school child, then voluntary desegregation will disrupt this pattern more than a mandatory reassignment. In a mandatory plan, a black student either moves with many of his classmates to a classroom in a white school, or remains with many classmates while whites are brought into his school. In either case, the result is less disruptive than if he volunteers to move, leaving most of his classmates behind.

These hypotheses are tentative. We do not recommend that voluntary plans be terminated in northern elementary schools on the basis of these data. But there are some recommendations that seem reasonable to make about northern voluntary plans:

1. They should begin in kindergarten or first grade.
2. Vigorous promotion efforts should be made to recruit as many volunteers as possible to minimize possible self-selection bias and create a critical mass of transferring students.
3. School staff should be permitted to recommend intensive remedial work for students who seem to have serious problems in school.
4. Receiving school staffs should be desegregated, and the receiving schools should be encouraged to use desegregation as an opportunity to achieve needed reforms.

Discussion

In this review there are a number of outstanding studies which merit recognition. In addition to the Mahan and Zdep experiments, the Teele book is impressive because of the author's attempts to outwit an intractable environment and produce a successful evaluation where most people would have

given up. Another study which deserves attention is Schellenberg and Halteman because it shows, more than any other study, an attention to the logic of the control group comparison where randomization is absent. The Evans analysis of Fort Worth and the evaluation of Goldsboro by Mayer, King, Borders-Patterson and McCullough are outstanding because of the completeness of the data--even to maps of the plan. This report deals with the desegregation planning process, community reaction, the logistics of the plan, staff preparation reactions of students to each other, and changes in teaching methods. It is not irrelevant to note that the four authors of this, the most comprehensive single evaluation of desegregation, are a white professor of city planning, a black sociologist, a black testing expert and a white psychologist. The diversity of race and discipline seems necessary.

The experimental tradition in psychology has been a source of both the strengths and the weaknesses of desegregation research. From that tradition we have borrowed a sophisticated methodology. Unfortunately we have failed to realize that in going from the laboratory to the real world we have lost control of the intervention. No two desegregation plans are alike; often one cannot even say they are similar, and there is little reason to expect an identical "treatment effect" of desegregation. The common error of this research can be stated in five words: Desegregation is not a treatment.

We think this explains why so many of the aspects of desegregation plans which need to be examined are not discussed in these studies. One problem is the absence of studies of the effects of desegregation past the second year. In general, however, our dissatisfaction stems not from the inadequacies of the design, but the inadequacy of the research reporting. For example, we would like to know if there is an optimal racial composition for the desegregated school, but three-quarters of the studies do not report

the racial composition of the schools either before or after desegregation. We would like to know the effects of different degrees of socioeconomic integration; again, there are usually no data. There is almost never information on the school curriculum, staff racial composition, teacher attitudes, staff preparation, special school programs or community reactions. We would especially like to see data on teacher racial behavior, since the evaluations of ESAA by NORC (1973) and SDC (Coulson et al., 1977, and Wellisch et al., 1977), the study of exemplary desegregated schools by ETS (Forehand et al., 1976), and the studies of Felice and Gerard and Miller all suggest that negative racial attitudes and behavior are harmful to black student attitudes and achievement.

What Can We Say About Desegregation and Achievement?

The best studies have in common a recognition of an important fact about desegregation--that desegregation is not a sterilized, laboratory controlled experiment which is identical in Jacksonville and in Berkeley. Every case is different, and we should not expect identical results every time. Thus one answer to the question "What is the effect of desegregation on achievement?," is "sometimes it works and sometimes it doesn't"--but this is true of any intervention. Can we say anything stronger? The answer seems to be yes, but it is important to state the question carefully. If the question is "Has desegregation resulted in increased achievement for blacks?," the answer hardly needs study, since desegregation has resulted in the closing of many inadequate segregated schools in both the North and the South. If the question is "Will desegregation in the future also increase black achievement?," the answer seems to be yes, with perhaps some reservations.

Pooling the data from our own review and those by St. John and Weinberg, we have identified 39 studies of desegregation plans involving mandatory

assignment of black students, in both the North and the South. Twenty-four of these report achievement gains, and 5 show losses--a 4:1 ratio favoring positive outcomes. The median positive gain (on the few studies where we have been able to code quantitative data) is around one-half of a grade equivalent change in the first one or two years. The input-output studies show somewhat larger differences.

A policy-maker will not be satisfied with this answer, however. He may ask, "Which is the most effective way to raise black achievement--through desegregation or through improving the quality of education in segregated schools?" Here the answer is probably that both approaches are effective and that we have not done enough work to say which is more effective. If the policy-maker then asks, "Are the gains in black achievement resulting from desegregation worth the social and political cost?," the question has no scientific answer, and becomes a matter of values.

We have stressed the differences between these various questions in order to suggest that the contradictory statements made by social scientists reflect not only disagreement about the data, but disagreement about the question being asked. The best examples of this confusion are the statements made about desegregation's impact on the "achievement gap." Certainly differences between black and white achievement are interesting, but the idea that black achievement is only worth having if it erases the gap seems to be based on a confused idea of the policy issues. There is also confusion about the sorting out of the direct and indirect effects of desegregation. For example, are the Zdep and Williams studies a fair test of desegregation's effects, given that the black school was hopelessly overcrowded in one case and had an inadequate curriculum in the other? The answer is certainly yes, since desegregation was the policy instrument that provided uncrowded schools and adequate curricula for these blacks. This doesn't mean that desegregation

always means going from a poor educational situation to a better one, which is why other studies do not show effects like these two did. Both recorded black gains of .5 to 1.0 standard deviations (1 1/2 to 3 grade levels) in two to three years. More typical positive results are on the order of .2 standard deviations.

Part of the confusion surrounding desegregation arises because we academics have frequently not viewed desegregation from a policy-making viewpoint. We have been too facinated by the intellectually most interesting question, which is, all else equal, will the mixing of races alone result in higher black achievement? We haven't been able to answer that question, because desegregation is never an "all else equal" situation in the real world. Desegregation sometimes results in better curricula or facilities; it often results in blacks having better trained or more cognitively skilled teachers, it is frequently accompanied by a major effort to upgrade the quality of education, and it almost always results in socioeconomic desegregation. When desegregation is accompanied by all of this, it should not surprise us that there are immediate achievement gains half to two-thirds of the time. This suggests that desegregation is sufficient but not necessary to obtain these gains, since there are other ways to achieve curriculum reform or better teaching if the political will is present.

The presence of all these complicating factors makes it difficult to determine exactly why desegregation has beneficial achievement effects when it does, and why it sometimes fails to produce these effects. Various writers have argued that desegregation is most successful in raising achievement when it results in one or more of five favorable conditions:

1. Black students have transferred to schools which have better facilities and better teaching.

2. The expectations to which blacks are held are higher in their new schools.

3. The newly desegregated schools have undergone a flurry of in-service preparation for teachers and have adopted new curricula.

4. Black students are influenced by higher-status college bound white peers with better study habits and less school rebellion.

5. Black students develop a greater amount of self-confidence from discovering that they can cope, both socially and academically, in a white environment.

But it is easy to imagine a desegregated situation where none of these five things happens. Thanks to Title I and the national concern about black achievement, many all-black schools have excellent facilities and staff. The white receiving schools may have teachers who are lazy, unconcerned, or whose training is obsolete. They may hold unfavorable attitudes toward blacks and express this in the low expectations they set for black students. The school may be entrenched, unwilling to adapt to the new situation. Race relations may be so poor that peer effects across races cannot occur, and black students may develop a sense of futility.

Between these two extremes are more complex cases, when one or another of these favorable factors appears, while others do not. For example, what achievement effects can we expect in schools which are desegregated, but predominantly black? If the white minority is bused into the school, the school administration may go to great lengths to strengthen the curriculum and modernize the facilities. If the white minority is a low-income group living near a black neighborhood the school may be thought of as a slum school and treated as one. As we begin to pursue the possibilities, we see hints of a very complex pattern of interaction effects and curvilinear relationships.

In our future work, we plan to search for these higher-order relationships, in an effort to answer some of the following questions:

1. What is the optimal racial composition of a desegregated school?
    a. Does this differ for different SES mixes?
    b. Does the optimum change during the first few years of the plan?
2. What is the impact of desegregation over time? Are achievement effects cumulative, or is there a honeymoon followed by a crisis?
3. What is the optimal SES "gap" between black and white students?

We suspect that if we can answer these questions, we will be closer to knowing why desegregation raises black achievement, in the short run (as it appears to do often) or in the long run (which apparently it almost always does). We should certainly know why it fails in the short run, which seems to happen also. We do not believe that this research review will ever tell us whether desegregation is a "good thing" or a "bad thing," since we are gradually coming to realize that this is more a matter of values than of data.

Table 1

BLACK SCHOOL-LEVEL ACHIEVEMENT TEST SCORES BY HIGH SCHOOL PERCENTAGE WHITE AND REGION, STATISTICALLY CONTROLLED FOR SES AND SCHOOL DISTRICT SIZE

	South		North	
	School Percent White		School Percent White	
	0%	90%	0%	90%
Mean Black Achievement	41.63	41.90	42.30*	45.99*

* $p < .05$

NOTE: Percentages are derived from a regression equation in which mean black SES, school district size and school percentage white are used to predict mean black achievement. Black achievement is reported in standard scores (i.e., $\bar{X} = 50$, $o = 10$), and achievement scores are computed from the equations by entering 0% and 90% as values of percent white.

Source: Crain and Mahard (1977)

Table 2

Number of studies with positive, zero, or negative effects on desegregation reviewed by the authors or by St. John and Weinberg.

		Author of Review				
		C+M	St. J.	W	W+St.J.	Total
Effect is:	+	19	8	8	5	40
	-	12	4	1	4	21
	0	10	0	1	1	12
Total		41	12	10	10	73
% +		46%	67%	80%	50%	55%

NOTES: C+M: Studies reviewed by Crain and Mahard
St.J, W, W+St.J: Studies not received at press time, but reviewed by St. John (1975), Weinberg (1977) or by both Weinberg and St. John.

Table 3

OVERALL EFFECTS OF REVIEWED STUDIES, BY REGION

		Region		
		North	South	Total
Effect is:	+	9	10	19
	-	11	1	12
	0	6	4	10
Total		26	15	41
% +		35%	67%	46%

Table 4

GRADE FIRST DESEGREGATED BY OUTCOME

Reviewed Studies:		Mean Grade First Desegregated 1-2	3-4	5-6	7-9	10-12	Total
SOUTH	+	2	3	2	2	1	10
	0	0	0	1	0	0	1
	-	0	1	1	1	1	4.40
Total		2	4	4	3	2	15
% +		100%	75%	50%	67%	50%	γ = .40
		1-2	3-4	5-6	7-9	10-12	
NORTH	+	3	3	3	0	0	9
	0	2	7	1	1	0	11
	-	0	3	1	2	0	6.36
Total		5	13	5	3	-	26
% +		60%	23%	60%	0%	-	γ = .36
		1-2	3-4	5-6	7-9	10-12	
Weinberg/St. John							
	+	3	3	6	1	1	14
	0	0	1	3	0	1	5
	-	0	0	1	0	1	2.77
Total		3	4	10	1	3	21*
% +		100%	75%	60%	100%	33%	γ = .77

*only 21 of 32 studies reviewed by Weinberg and/or St. John appear in this table; the reviewer did not indicate the grade level in the other 11.

Table 5

NORTHERN VOLUNTARY AND MANDATORY PLANS BY OUTCOME

		Voluntary	Mandatory	Total
Review Sample	+	2	7	9
	0	5	6	11
	-	4	2	6.54
Total		11	15	26
% +		18%	47%	35%
				γ = .54
St. John/Weinberg Sample	+	6	7	13
	0	4	2	6
	-	1	0	1.51
Total		11	9	20
% +		55%	78%	65%
				γ = .51
Review Sample Using Only Longitudinal Designs With Black Control Group				
	+	1	4	5
	0	3	2	5
	-	2	0	2.85
Total		6	6	12
% +		17%	67%	42%
				γ = .85

Footnotes

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1. Although occasional studies show white test scores going up after desegregation (e.g., Stallings, Mayer, et al.) and others show decline (e.g., Baltzell, Justin and Thabit, Kurtz) the majority find no significant change and Kurtz is the only writer we know of who has argued that white test scores are affected by desegregation.

2. Generally, one standard deviation of a standard achievement test is equivalent to about three grades of normal growth.

3. The 41 studies represent data from 35 desegregation plans by 38 different authors. In 3 cases, two different authors study the same plan; in 3 other cases, a study was treated as two separate studies, once because different methodologies were used at different grade levels, and twice because different results were obtained in different schools or in different years of a continuing evaluation.

4. Gamma is a non-parametic measure of association. As the rule of thumb, Gamma is about twice the size of the Pearson correlation for small values, and both are bounded by $\pm$ 1.0.

5. The Teele story is worth reading for his account of an evaluator at work and what happens when a conservative school board confronts a black researcher evaluating a black-run school program.

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